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10/809,833

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Claire Barroux

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EXAMINER

CRAIG, DWIN M

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/809,833

Applicant(s)

BARROUX, CLAIRE

Examiner

Dwin M. Craig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☒ Claim(s) 1,6,7,9,10 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/26/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-13 have been presented for examination.

Claim Objections

2. Claims 1, 6 and 7 are objected to because of the following informalities: In claim 1 the words “*behavior*” and “*vapor*” are misspelled. In claims 6 & 7 the word “*modeling*” is misspelled.

2.1 In claim 1 there appears to be a lack of antecedent basis for the phrase *the separation* in the current claim language.

2.2 In claim 1 there appears to be a lack of antecedent basis for the phrase *the fluids*.

2.3 In claim 9 there appears to be a lack of antecedent basis for the phrase *the first state equation*.

2.4 In claim 10 there appears to be a lack of antecedent basis for the phrase *the fluids*.

2.5 In claim 12 there appears to be a lack of antecedent basis for the phrase *the fluids*.

2.6 In claim 12 there appears to be a grammatical mistake, on line 2 of the claim is the phrase, *representing the reservoir in form of network grid cells...* the phrase should read, *representing the reservoir in the form of network grid cells...*

Appropriate correction is required.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed

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150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The Abstract is over 150 words correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-13 are directed towards a method comprising a series of steps for manipulation of datum that is then organized and compared via a specified criteria equivalent to mental steps. Applicant is reminded that mental processes are not statutory subject matter under 35 USC 101.

The method claims are not statutory as any computer-implemented method must produce a result, which is concrete, tangible and useful. As set forth in MPEP 2106(IV)(B):

“In practical terms, claims define nonstatutory processes if they:

-consist solely of mathematical operations without some claimed practical application (i.e., executing a “mathematical algorithm”); or

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-simply manipulate abstract ideas, e.g. a bid (Schrader; 22 F.3d at 293-94, 30 USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759), without some claimed application.”

As the claims in the instant application recite steps to manipulate data, (claim 1 for example, *estimating the properties or the behavior of liquid and/or vapor hydrocarbon phases from data relative to a reference set*) the claimed method does not produce a tangible, useful result, claims 1-13 do not recite statutory subject matter further, merely grouping and determining the separation of products does not teach a composition of matter, it is disclosing only a method of organizing data, which does not disclose a concrete, useful and tangible result.

As set forth in MPEP 2106 (IV)(B)(2)(b)(ii):

“A claim is limited to a practical application when a method, as claimed, produces a concrete, tangible and useful result; i.e., the method recites a step of act of producing something that is concrete, tangible and useful result (as in *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601) and/or when a specific machine is being claimed (as in *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557 (in banc)). For example, a computer process that simply calculates a mathematical algorithm that models noise is nonstatutory.

The MPEP § 2106 (IV)(B)(2)(b)(ii) states the following example:

A computer process that simply calculates a mathematical algorithm that models noise is nonstatutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory.

Comparing the above discussion to claims 1-13, the claimed method merely creates a grouping of chemicals being mixed together...*grouping each one of said hydrocarbon mixtures into at least three constituents...* and then determining a first and second

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constituent...*determining by material balance the compositions of the separation products comprising, for the gaseous products, at least a first and second constituent...* and then a determination is made as to the composition of a mixture to create a reference set...*determining the at least three-constituent composition of each hydrocarbon mixture of the reference set by combination of the products of the separation thereof in proportion to the amounts of each separation product.* As claimed the method steps describe a series of operations to manipulate a symbolic representation of chemical compounds and liquid mixtures and therefore merely disclose a manipulation and ordering of data with no concrete, tangible and useful result.

As set forth in MPEP § 2106 (IV)(B)(2)(b)(i)

“Examples of claimed processes that do not achieve a practical application include:

- step of “updating alarm limits” found to constitute changing the number value of a variable to represent the result of the calculation (Parker v. Flook, 437 U.S. 584, 585, 198 USPQ 193, 195 (1978));
- final step of “equating” the process outputs to the values of the last set of process inputs found to constitute storing the result of calculations (In re Gelnovatch, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979); and
- step of “transmitting electrical signals representing” the result of calculations (In re De Castelet, 562 F.2d 1236, 1244, 195 USPQ 439, 446 (CCPA 1977) (“That the computer is instructed to transmit electrical signals, representing the results of its calculations, does not constitute the type of post solution activity’ found in Flook, [437 U.S. 584, 198 USPQ 193 (1978)], and does not transform the claim into one for a process merely using an algorithm. The

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final transmitting step constitutes nothing more than reading out the result of the calculations.”));
and

-step of displaying a calculation as a gray code scale (In re Abele, 684 F.2d 902, 908, 214 USPQ 682, 687 (CCPA 1982)).”

Comparing the above examples to claims 1-13, the claimed method merely performs determinations and groupings and more closely resembles the example of comparing process outputs, which as shown does not result in a practical application.

Claims 1-13 fail to teach or disclose even the storing in a memory or the display of the *reference set*. It is noted that a claim may be statutory when it identifies the physical structure of manufacture in terms of its hardware, or a hardware software combination. Claims 1-13 do not recite any physical or hardware limitations, as set forth above. It is also noted that a claim directed to a product that has a practical application in the arts may be statutory; e.g. a computer comprising a program that produces a concrete, tangible and useful result, as decided in *Alappat* (31 USPQ2d 1557) and *State Street* (47 USPQ2d 1601). As set forth above, the claimed method does not produce a concrete, tangible and useful result, therefore the method comprising grouping of fluids or mixtures and determining compositions and different constituents and then determining a composition mixture fails to disclose a useful, concrete and tangible result and further fails to disclose a combination of matter such that the disclosed teachings of the claimed subject matter are directed towards statutory subject matter.

Therefore, claims 1-13 are considered to be non-statutory subject matter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,212,488 Meier et al.

5.1 As regards independent claim 1, Meier discloses, *a lumping method for estimating the properties or the behavior of liquid and/or vapor hydrocarbon phases from data relative to a reference set consisting of hydrocarbon mixtures in a series of thermodynamic states resulting from determined conditions of production of an underground hydrocarbon reservoirs, characterized in that it comprises:*

(Figure 2, Figure 3 references 46 & 52, and the descriptive text and Col. 2 lines 25-67 and Col. 3 lines 1-10),

grouping each one of said hydrocarbon mixtures into at least three constituents (V, I, H), none of these constituents corresponding to a particular selection of base components or pseudo-components that would be used for a detailed compositional description of the fluids, considering that the gas phases resulting from the separation under surface conditions of each one of the hydrocarbon mixtures are mixtures from which third constituent (H) is excluded, and that the oil phases resulting from the separation under surface conditions of each one of the hydrocarbon mixtures are mixtures from which first constituent (V) is excluded, determining by material balance the compositions of the separation products comprising, for the gaseous

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products, at least the first and the second constituent (V, I) in variable proportions and, for the liquid products, at least the second and the third constituent (I, H) in variable proportions, (Figures 2 & 5 and the descriptive text and Col. 1 lines 55-67 specifically, "...measured impurities (sulfur, Ni, and V), basic nitrogen, carbon residue and viscosity" the examiner is mapping the property of *viscosity* to Applicants' *V* component, and as regards *gaseous products* that are not pseudo-components see Col. 3 lines 63-67 and Col. 4 lines 1-35 more specifically "*A stream of spent coked catalyst is continuously passed from stripper...*" coke is not a pseudo-component and it is being modeled, see also Col. 5 lines 53-67 and Col. 6 lines 1-3, more specifically "Including the thirty-four pseudo-components plus the light gases and coke do not undergo cracking..." note that the coke and light gases, along with the viscosity make up three components being modeled that are not pseudo-components see also all of Col. 5-7 see also Col. 8 lines 11-26),

and, for the liquid products, at least the second and the third constituent (I, H) in variable proportions, and determining the at least three-constituent composition of each hydrocarbon mixture of the reference set by combination of the products of the separation thereof in proportion to the amounts of each separation product.

(Tables I-IV and Col. 12 lines 56-67 and Figure 3 it is noted by the examiner that the tables comprise variable proportions of the chemical products)

5.2 As regards dependent claim 2, *Meier* discloses, *wherein each one of the hydrocarbon mixtures is grouped into only three constituents (V, I, H), the gas phases resulting from said separation being mixtures in variable proportions of first constituent (V) and of second constituent (I), the oil phases resulting from said separation are mixtures in variable proportions*

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of second constituent (I) and of third constituent (H), and the three-constituent composition is determined.

(Figure 1 and the descriptive text more specifically, Col. 3 lines 63-67 and Col. 4 lines 1-35, The examiner notes that the “*cracking*” process as disclosed in the descriptive text teaches that the different constituents are affected by the different phases of the “*cracking*” which include the different mixtures transitioning between phases from liquid to vapor “*gas phases*” and that the mixtures are in variable proportions, see Col. 4 lines 64-67 and Col. 5 lines 1-65 and Col. 6 lines 1-16 which describes the different resultant mixture concentrations of the *pseudo-components* as well as the *non-pseudo-components* during the simulation of the “*cracking*”.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 3-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,212,488 Meier et al. in view of US Patent 6,108,608 Watts.

6.1 As regards dependent claim 3 *Meier* does not expressly disclose, *wherein the surface conditions are the conditions encountered or expected during reservoir production.*

However, *Watts* teaches, *wherein the surface conditions are the conditions encountered or expected during reservoir production* (Figure 1 and the descriptive text).

Meier and *Watts* are analogous art because they are from the same field of endeavor regarding the simulation of hydrocarbon processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the methods of modeling *cracking* as disclosed in *Meier* in combination with the methods of modeling a reservoir as disclosed in *Watts*.

The suggestion would have been because reservoir simulation can be used effectively to simulation the hydrodynamic flows of petroleum systems and multi-component systems and an artisan would take advantage of the teachings of *Watts* rather than have to create a while new methodology, *see Watts* Col. 1 lines 34-60, and therefore the methods of *Watts* disclose a way to address the need in the art for developing components for reservoir simulation, *see Watts* Col. 3 lines 10-58.

Therefore, it would have been obvious to combine *Watts* with *Meier* to obtain the invention as specified in claims 3-11 and 13.

6.2 As regards dependent claim 4, *Meier* does not expressly disclose *wherein the surface conditions are different from the conditions encountered or expected during reservoir production.*

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However, *Watts* teaches, *wherein the surface conditions are different from the conditions encountered or expected during reservoir production* (Figure 1 and the descriptive text).

6.3 As regards dependent claims 5 and 13, *Meier* discloses, wherein the material balance is a mass balance is assigned to each one of the three constituents (V, I, H) after quantitative analysis of the separation products of the reference set. *See the rejection above...*

However, *Meier* does not expressly disclose *molar masses* being calculated.

Watts teaches, *molar masses being calculated* (Col. 2 lines 24-38).

6.4 As regards dependent claim 6, *Meier* does not expressly disclose *wherein the data necessary for equilibrium calculation and for modeling the phase properties in the lumped representation are defined using the compositions of the phases in the lumped representation and known or estimated a priori data relative to at least the density and the viscosity of the oil and gas phases at equilibrium belonging to the reference set.*

However, *Watts* discloses, (Col. 1 lines 39-60).

6.5 As regards dependent claims 7-11 *Meier* does not expressly disclose a plurality of state equations and the disclosed limitations therein as expressly claimed in claims 7-11.

However, *Watts* discloses (Col. 9-25).

Allowable Subject Matter

7. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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7.1 As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

7.2 The following is a statement of reasons for the indication of allowable subject matter: While *Meire* discloses a method of modeling different components in a distillation stack and *Watts* discloses methods of modeling hydrocarbon behavior in an oil reservoir, **none of these references taken either alone or in combination with the prior art of record disclose**, the various specific modeling methodologies in relations to the thermodynamic zones of a hydrocarbon reservoir, specifically including:

(claim 12) "...comprising representing the reservoir in form of a network of grid cells (m) wherein each one forms an elementary volume filled with fluids in form of one or more phases, with at least one non-aqueous phase, defining, for each thermodynamic zone or range, the fluids by a detailed base representation, so as to determine the amount of each base constituent (i) in each hydrocarbon phase in each grid cell (m) at the time defined as initial for the delumping calculation, per thermodynamic zone for which a lumped representation of the fluids is selected, determining a state equation constructed prior to dynamic reservoir simulation with the lumped representation, to reproduce the phase parameters, in the state equation of the detailed representation, of the hydrocarbon fluids along thermodynamic paths considered to be representative of those that will be followed by the hydrocarbon fluids during the gridded simulation, carrying out, at a time interval t , a compositional simulation with a limited number of constituents wherein the phase properties are calculated by a state equation, said simulation allowing to calculate at least in each grid cell (m) and at consecutive time intervals a pressure for

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a hydrocarbon phase, the temperature when it varies, the flow rates of the phases between grid cells and at the production and injection perforations, and the values of parameters and/or phase properties involved in the formal expression of the equilibrium coefficients of the detailed representation, and storing these various quantities, estimating at the next time interval (t+1) the molar fraction of each constituent i in the global detailed composition of the hydrocarbon fluid in grid cell (m) by material balance on grid cell (m), determining, using the quantities stored, at the same time interval (t+1) and in each grid cell (m), the equilibrium coefficients of each constituent (i) in the detailed representation, determining, in the same time interval (t+1), the vaporized fraction in each grid cell (m), and estimating the detailed composition of each hydrocarbon phase, at the same time interval (t+1) and in each grid cell (m)...”, in combination with the remaining elements and features of the claimed invention. It is for these reasons that the applicant’s invention defines over the prior art.

Conclusion


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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10/30/02